

**INTERNATIONAL PRELIMINARY  
REPORT ON PATENTABILITY  
(SUPPLEMENTARY SHEET)**

International File No.

PCT/EP2004/008385

**IAP20 Rec'd PCT/TO 31 JAN 2006**

**Item IV**

**Lack of Unity of Invention**

The international application contains two inventions that are not linked by a single, general inventive idea (rule 13.1 of the PCT).

Group I: Claims 1 (edged supporting element), 2-4, 6-16

Group II: Claims 1 (supporting element as a separate part), 4-12

Document D1=DE3619096 applies as relevant prior art for assessing the unity of invention. It describes a ratchet lever with formed supporting element; see Fig. 6, ref. 89.

As shown by a comparison of these groups of claims with the cited document, the following features contribute to prior art, and can hence be viewed as special technical features under rule 13.2 of the PCT:

Group I: Ratchet lever (7.1-7.5) consisting of a sheet metal blank, from which the supporting element (18) is folded.

Group II: Supporting element as a separate part (18.1, 18.2) that rests on the rotational axis (13).

While evaluating whether potentially shared special technical features arise from a technical effect, it was found that the technical effect of the first group involves ratchet levers consisting of a single part, while the technical effect of the second group involves ratchet levers consisting of multiple parts.

As a result, no technical interrelationship was found to exist between the inventions based on the special technical features that might realize a single, general inventive idea.

**Item V**

**Substantiated Determination relative to Novelty, Inventive Activity and Commercial Applicability; Documents and Declarations in Support of this Determination**

The first invention differs from the prior art in D1=DE3619096 in that the ratchet levers consist of a sheet metal blank with supporting elements folded from it, while the second invention has supporting elements separate from the ratchet levers that rest on the shared rotational axis. No examples for these designs became known in the area of the stacking columns. Viewed overall, the claimed objects are new and inventive within the meaning of Art. 33(2) and (3) of the PCT.

**Item VIII**

**Specific Comments concerning the International Application**

Claim 13 does not clearly state that the folded tongues are supporting elements. However, this would be significant, since the supporting elements technically link Claims 1 and 13 (Art. 6 of the PCT).

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### **Stacking Column**

The invention relates to a stacking column for holding warehouse items, in particular bodywork parts, on the support arms of ratchet levers, which pivot around a rotational axis from a resting position into a working position, wherein a plurality of ratchet levers are located above one another or next to one another and the ratchet lever rotates together with a supporting element, which rests on or against a preceding ratchet lever in the working position.

### **Prior Art**

Stacking columns are known in a variety of models and designs. Most of them are perpendicular stacking columns arranged in a rectangular configuration. For example, such stacking columns are shown in DE-PS 35 36 251, or also in DE-OS 38 11 310.

It may also be advisable for certain reasons to have these stacking columns be slanted, as depicted in DE-OS 41 33 464. Further, the stacking columns can also be horizontally arranged in accordance with DE-OS 40 20 864.

These stacking columns are preferably also enveloped by a protective section, as described in greater detail in EP-A 93 10 42 23.

In all of these stacking columns, the warehouse items lie in or on the support arms of ratchet levers, such that these ratchet levers return to their resting position right after the load has been removed. Further, it was discovered that individual ratchet levers again flip back into their resting position when the mounting frame jumps owing to unevenness in the road, e.g., during transport. To this end, it is known from DE 36 19 096 to form a supporting element on a ratchet lever, which rotates with the ratchet lever, and rests on a preceding ratchet lever in the working position.

### **Object of the Invention**

The object of this invention is to provide a stacking column in which the ratchet levers are very simply manufactured and functionally formed.

### **Description of the Invention**

This object is achieved by means of a ratchet lever consisting of a sheet metal blank, from which the supporting element is folded, or the supporting element that also rests on the rotational axis as a separate part.

This means that the supporting element rests against the lower or directly adjacent ratchet lever in the working position, and cannot automatically return to its resting position, even after the load has been removed. Therefore, the supporting element is preferably secured in a self-restraining manner.

In one exemplary embodiment, the supporting element can be designed as an independent element, and also lie on the rotational axis. It preferably underpins the ratchet lever allocated to it, and is positively

primarily to restrain the supporting element so that the latter does not just automatically exit the support position. To this end, it may make sense to fold the guide tongue up diagonally, or make it somewhat curved in shape. Of course, the curvature then interacts with the radius of the face of the supporting element.

Further, one exemplary embodiment of the invention envisages that the supporting element interacts with a ratchet lever that is actuated before it, so that this ratchet lever, acting by way of the supporting element, can move the next ratchet lever from a resting position to a ready position, or from a ready position into a working position. For this purpose, one exemplary embodiment provides for a bolt on the preceding ratchet lever that presses against a foot on the supporting element, thereby causing the next ratchet lever to pivot around its rotational axis.

In another exemplary embodiment of the invention, ~~for which separate protection is also desirable~~, a stop lying against the rotational axis of the next ratchet lever in the working position projects up from the ratchet lever. This limits the rotational travel of the ratchet lever in a simple manner.

In order to limit the rotational travel, it may prove beneficial to have either the width of the stop or outer diameter of the rotational axis be selectable. In the latter case, it may again be easy to place a spacer ring with a selectable outer diameter on the rotational axis.

For the sake of simplicity, the stop can consist of the folded up lateral cheek when using a ratchet lever made from the aforementioned sheet metal blank.

A latching device is preferably also allocated to the ratchet levers configured in this way. This means that the last ratchet lever is securely held in its working position. Provided to this end is a slider, for example, which can move a stud, and presses it onto the uppermost ratchet lever.

Both the stud and a threaded section or guide pin project from the slider, wherein each of them passes through a parallel, curved elongated hole. In this way, the stud can be moved from a resting position into a locked position.

The slider can preferably be fixed in place both in a resting and locked position, which is accomplished by way of a tie bolt that passes through a corresponding hole in a lateral cheek. The tie bolt can be withdrawn from this hole by means of a control knob, which preferably takes place against the force exerted by a spring.

The rear area of known ratchet levers often has a weight that causes the ratchet lever to return to its ready or resting position after the object placing a load on the ratchet lever has been removed. In particular in cases where the ratchet levers are made to rest one against the other by the supporting elements according to the invention, however, the supporting effect exerted by the supporting elements may make this more difficult. In order to facilitate the return of the ratchet lever to the ready or resting position, springs that press the ratchet lever into the resting position should therefore be provided. In other words, the ratchet lever is moved from the resting position into the ready position, and preferably also into the working position, against the force exerted by the springs. The springs are preferably located in a shared spring rack. ~~While protection is desired separately for this concept, it is especially important during the use of the supporting elements according to the invention.~~

CLAIMS

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1. Stacking column for holding warehouse items, in particular bodywork parts, on the support arms (6) of ratchet levers (7.1-7.6), which pivot around a rotational axis (13) from a resting position into a working position, wherein a plurality of ratchet levers (7.1-7.6) are located above one another or next to one another and co-operate with one another, characterized in that the ratchet lever (7.1-7.5) consists of a sheet metal blank, from which the supporting element (18) is folded, or the supporting element (18.1, 18.2) also rests on the rotational axis (13) as a separate part.
2. Stacking column according to Claim 1, characterized in that at least one control arm (8) is also folded from the sheet metal blank.
3. Stacking column according to Claim 2, characterized in that an upwardly projecting lateral cheek (10) is folded up from the control arm (8), abutting the rotational axis (13) of the next ratchet lever (7.1-7.4) in the working position.
4. Stacking column according to one of Claims 1 to 3, characterized in that the supporting element (18.2) forms a foot (22), to which a lateral bolt (23) of the preceding ratchet lever (7.4) is allocated.
5. Stacking column according to at least one of the Claims 1 to 4, characterized in that the supporting element (18.1, 18.2) is positively joined with the ratchet lever (7.1, 7.2).
6. Stacking column according to at least one of Claims 1 to 5, characterized in that the ratchet lever (7.1-7.5) has a guide tongue (20) for sliding on the supporting element (18).

7. Stacking column according to Claim 6, characterized in that the guide tongue (20) is at least partially upwardly directed, in particular curved.
8. Stacking column according to at least one of Claims 1 to 7, characterized in that the uppermost ratchet lever (7.1) has allocated to it a latching device (27), in which a slider (31) with at least one, preferably two bolts (28, 32) or the like passes through one or two parallel, curved elongated holes (26.1, 26.2), wherein a bolt (32) presses on the uppermost ratchet lever (7.1) in the latching position.
9. Stacking column according to Claim 8, characterized in that the slider can be fixed in place by means of a tie bolt (32) in or outside the latching position.
10. The stacking column according to at least one of Claims 3 to 9, characterized in that a spacer ring (17.1, 17.2) with a selectable outer diameter is placed in the area of the lateral cheek (10) of the rotational axis (13).
11. The stacking column according to at least one of Claims 1 to 9, characterized in that at least some ratchet levers (7.1-7.6) have allocated to them a spring (37.2-37.6) that moves the respective ratchet lever into the resting position.
12. Stacking column according to Claim 11, characterized in that the springs (37.2-37.6) are arranged on a spring rack (38).
13. Method for manufacturing a ratchet lever for use in a stacking column for holding warehouse items, in particular bodywork parts, on the support arms (6) of ratchet levers (7.1-7.5), which pivot around a rotational axis (13) from a resting position into a working position, wherein a plurality of ratchet levers (7.1-7.5) are located above one another or next to one another and co-operate with one another, characterized in that a sheet metal blank is provided with tongues (11.1, 11.2) to the respective sides of middle section (9) between the support arm (6) and a control arm (8), and the tongues are provided with a respective recess (12.1, 12.2)

that extends partially into the middle section (9), wherein each tongue (11.1, 11.2) is bent in the area of the recess (12.1, 12.2).

14. Method according to Claim 13, characterized in that the support arm (6) and/or the control arm (8) is folded from the middle section (9).
15. Method according to Claim 13 or 14, characterized in that a lateral cheek (10) is folded up from the control arm (8).
16. Method according to one of Claims 13 to 15, characterized in that at least one tongue (11.2) has projecting from it a supporting element (18) integrally molded thereto.